

CLAIMS

1. A process of relative positioning between an agricultural machine and crops on their planting rows, comprising the steps of arranging sensing means forwardly of a center of a rotor of an agricultural machine and at a distance which is at least equal to or greater than a top radius of trees to be worked with the radius being measured in a planting row direction; sensing the tree top by the sensing means to determine a rearward point, a forward point, a center point and a farthest transverse point from the center point of a tree top; and adjusting the rotor to define a trajectory of the rotor center with respect to said points; and repeating said steps for each of the trees in the planting row to be worked.

2. A process as defined in claim 1; and further comprising processing data obtained from said sensing means about said points of the tree top so as to provide an interpolation of the points of the tree top and to establish a curve to be followed by the rotor center with as less irregularities as possible.

3. A process as defined in claim 1; and further comprising establishing a trajectory to be followed by the rotor center to contour the tree top, by a processor which does not consider local irregularities or discontinuities but follows a trajectory to avoid excessive and unnecessary correction movements made by a combination of a first displacement to stand back of the planting row and a second displacement of the agricultural machine parallel to the planting row, so that the rotor center contours the tree top but does not hit the tree top.

4. A process as defined in claim 1; and further comprising determining the position of the top center point in a sequence of the trees of the planting row by analyzing a sequence of the rearward point, the forward point and the farthest transverse point of the tree top of a given planting row; checking the position and correcting the position from time to time with arrival of new rearward, forward and farthest transverse points, and defining a planting row between the tree tops from the tree tops center points resulting from evaluation of the sequence of the rearward, forward and farthest transverse points.

5. A process as defined in claim 1; and further comprising placing the rotor center at a distance from the farthest transverse point of the tree top; maintaining the distance along an entire trajectory during following of the tree top; and maintaining a predetermined distance between the tree tops at a predetermined value in relation to the planting row.

6. A process as defined in claim 1; and further comprising displacing the rotor between two consecutive tree tops at a parallel trajectory and at a predetermined distance from the planting row; contouring the tree top over a trajectory starting at a rearward point and ending at a forward point at a distance from the tree top; and selecting the distances such that rod ends of the rotor are on another side of the planting row during displacement in a space between two consecutive trees so as to fully reach regions around the rearward point and the forward point of the tree top.

7. A device for relative positioning between an agricultural machine and crops on their planting rows, comprising sensing means

arranged forwardly of a sensor of a rotor of an agricultural machine and at a distance which is at least equal to or greater than a top radius of trees to be worked with the radius being measured in a planting row direction and sensing the tree top by the sensing means to determine a rearward point, a forward point, a center point and a farthest transverse point from the center point of a tree top; and means for adjusting the rotor to define a trajectory of the rotor center with respect to said points, whereupon said steps are repeated for each of the trees in the planting row to be worked.

8. A device as defined in claim 7; and further comprising means for processing of data obtained from said sensing means about said points of the tree top so as to provide an interpolation of the points of the tree top and to establish a curve to be followed by the rotor center with as less irregularities as possible.

9. A device as defined in claim 7; and further comprising means for establishing a trajectory to be followed by the rotor center to

contour the tree top, by a processor which does not consider local irregularities or discontinuities but follows a trajectory to avoid excessive and unnecessary correction movements made by a combination of a first displacement to stand back of the planting row and a second displacement of the agricultural machine parallel to the planting row, so that the rotor center contours the tree top but does not hit the tree top.

10. A device as defined in claim 7; and further comprising means for determining the position of the top center point in a sequence of the trees of the planting row by analyzing a sequence of the rearward point, the forward point and the farthest transverse point of the tree top of a given planting row, checking the position and correcting the position from time to time with arrival of new rearward, forward and farthest transverse points, and defining a planting row between the tree tops from the tree tops center points resulting from evaluation of the sequence of the rearward, forward and farthest transverse points.

11. A device as defined in claim 7; and further comprising means for placing the rotor center at a distance from the farthest transverse point of the tree top, maintaining the distance along an entire trajectory during following of the tree top, and maintaining a predetermined distance between the tree tops at a predetermined value in relation to the planting row.

12. A device as defined in claim 7; and further comprising means for displacing the rotor between two consecutive tree tops at a parallel trajectory and at a predetermined distance from the planting row, contouring the tree top over a trajectory starting at a rearward point and ending at a forward point at a distance from the tree top, and selecting the distances such that rod ends of the rotor are on another side of the planting row during displacement in a space between two consecutive trees so as to fully reach regions around the rearward point and the forward point of the tree top.